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OCT. 18. 1960

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GERMAN DELEGATION

COCOM DOCUMENT 4193
Paris, October 17, 1960

MEMORANDUM
BY THE GERMAN DELEGATION ON THE EXPORT
TO POLAND OF AN AIRPORT RADAR SYSTEM ASR-3

The German Delegation wish to inform the Committee that a request has been received for a licence to export to Poland a

Airport Radar System ASR-3 with accessories
covered by item 1501 1 d and 2
valued at $ 309.524,-

The technical characteristics are given as Annex to this document.

The German authorities consider that no technical know-how is involved in this delivery. The equipment is destinated to extend an Approach Radar System for the Ocencie airport (Warsaw) as a Airport Surveillance Radar System in order to make possible a reliable control of the air traffic within a larger radius. This Approach Radar System which is not embargoed has already been purchased by the Warsaw airport administration. The civilian airport of Warsaw being used regularly by numerous airlines, this radar system would serve as well the security of western aeroplanes.

The equipment is to be installed in Warsaw by technicians of the German delivery firm. The usual assurances against reexport and diversion have been obtained.

The German delegation submit this request under the special policy adopted towards Poland and trust that due to the civilian end-use stated favorable answers of the member countries will be received.

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ANNEX to COCOM Doc. 4193

General: Type CA-3100, BENDIX-Design, in accordance with CAA-Specifications R-864 of February 20, 1950, and with ICAO-Recommendations.

System Charateristics:

Coverage, Angle: 360° in azimuth and 0.5° to 20° above horizontal.

Coverage, Altitude: 10.000 feet (3000 meters) for aircraft of the light plane class, e.g. Piper-Cub.

Coverage, Range: Up to 26 nautical miles (48 kilometers) for smaller aircraft and 50 miles (90 kilometers) for larger aircraft.

Azimuthal Accuracy: Within ± 1°.

Distance Accuracy: Distance accuracy of system is such that targets are shown within 3% of true distance, or distance represented by 1/32 inch (0.8 millimeter) on face of indicator, whichever is larger.

Azimuthal Resolution: 2.5° provided equal distance and targets of light plane class.

Distance Resolution: Distance resolution is such that targets of light plane class separated by distance represented by 1.5 times the pulse width (740 feet or 225 meters), or the distance equal to 1% of the sweep range in use, whichever is larger, and at same bearing, are indicated as separate targets.

Antenna:

Horizontal Beaming: Beam width is 2.5° at 50% power points, 4.5° at 10% power points, and 6.25° at 2% power points.

Vertical Antenna Pattern: Cosecant-squared type pattern, coverage to 10.000 feet (3000 meters) altitude for smaller aircraft.

Exciter: Horn feed, for frequency range 2700 to 2900 mc/s.

Reflector Dimensions: approx. 13 feet (4 meters) high and 10 feet (3 meters) wide.

Reflector Tilting Angle: Adjustable between 0° and 5°

Antenna Gain: 36 db

Admissible Feed Length: 80 feet (25 meters) (measured between antenna pedestal and waveguide switch).

Antenna Speed: 27 rpm

Antenna Scan: Clockwise (viewed from above)

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Speed Variations by Wind Loads:	± 1 rpm for wind velocities up to 51.5 knots (90 kilometers per hour) ± 2 rpm for wind velocities of 51.5 to 64 knots (90 to 115 kilometers per hour)
Motor Power:	5 Hp
Transmitter:	
Frequency:	2700 to 2900 megacycles (11.1 to 10.3 cm)
Transmitting Tube:	Magnetron, air-cooled
Peak Power:	460 kilowatts
Average Power:	550 watts
Modulation:	Pulse type
Pulse Width:	1 micro-second
Pulse Repitition Frequency:	1200 cycles
Receiver:	
Type:	Superheterodyne
IF-Frequency:	30 megacycles
Bandwidth:	
IF-Amplifier for Normal and MTI-Video:	1.75 to 2.25 megacycles
Video circuits from second detector to indicator tube:	at least 90 % of IF-bandwidth
Noise Figure:	12 db or less
Sensitivity for normal video reception:	93 db below one milliwatt (93 dbm) when Signal-To-Noise Ratio (S/N) = 2.
Sensitivity for MTI reception:	Equals that of normal receiver.
Over-All Gain of All IF and Video Stages:	106 db
Receiver Oscillator:	Self-excited, stabilized, automatic frequency control provided to maintain constant 30-megacycle IF-frequency.
Console (Display Unit):	
Indicator Tube:	10-inch (25-cm) Cathode Ray Tube, PPI presentation, intensity modulation.
Ranges:	6, 10, 20, 30 and 50 nautical miles.
Range Marks:	Concentric rings, with 2-mile markers on 6- and 10-mile ranges, 5-mile markers on 20- and 30-mile ranges, and 10-mile markers on 50-mile range.

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Special Features:	Off-centering of sweep origin in any direction up to screen edge.
Presentation of Data: (Display Types)	1. Normal Video (display of fixed and moving targets); 2. MTI-Video (moving targets only); 3. MTI-Video combined with Normal Video as faint background; 4. MTI-Video for "close in" targets, Normal Video for distant range; MTI-range gating is variable from near Zero miles to maximum range of 50 miles; 5. Same as under 4., but with additional Normal Video as background to MTI-display.
Display of Reference Data:	By separate Video Mapping Equipment; any combination with display types is possible.
Admissible Distance between Transmitter-Receiver Site and Console:	1,7 naut. miles (3.1 kilometers) maximum (cable lenght)
Power Supply:	
Overall Power Consumption:	120/208 volts ac, three-phase, $\cos \varphi = 0.84$, 9.0 kilowatts 120 volts ac, single-phase, $\cos \varphi = 0.90$ 1.7 kilowatts
Voltage at Transmitter-Receiver Site:	120/208 volts ac, three-phase
One channel preheat; antenna off:	7,3 amp; $\cos \varphi = 0.85$; 2.24 kilowatts
One channel preheat; one channel on; antenna on:	25.3 amp.; $\cos \varphi = 0.81$; 7.07 kilowatts
Both channels on; antenna on:	33.8 amp.; $\cos \varphi = 0.84$; 8.65 kilowatts
Voltage at Master Console Equipment:	120 volts ac, single-phase
Console on; Console equipment on:	11 amp.; $\cos \varphi = 0.82$; 1.2 kilowatts
Console on; console equipment on; video mapping on:	17 amp.; $\cos \varphi = 0.90$; 1.7 kilowatts
Line Frequency:	50 cycles $\pm$ 1 cycle or 60 cycles $\pm$ 1 cycle
Line Voltages:	Preset-transformers permit use of the conventional line voltages.
Admissible Line Voltage Variations:	Depending on regulator type, e.g.+5% to-15%

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